



Meadow Argus
(*Junonia villida*)
on *Verbena* species

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PLANNING AND ORGANIZATION MEETINGS

A quarterly meeting is scheduled in order to plan club activities and the magazine.
See BOIC Programme.

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Membership fees are \$30 for individuals, schools and organizations.

AIMS OF ORGANIZATION

- To establish a network of people growing butterfly host plants;
- To hold information meetings about invertebrates;
- To organize excursions around the theme of invertebrates e.g. butterflies, native bees, ants, dragonflies, beetles, freshwater habitats, and others;
- To promote the conservation of the invertebrate habitat;
- To promote the keeping of invertebrates as alternative pets;
- To promote research into invertebrates;
- To encourage the construction of invertebrate friendly habitats in urban areas.

MAGAZINE DEADLINES

If you wish to submit an item for publication the following deadlines apply:

March issue – February 1st

June issue – May 1st

September issue – August 1st

December issue – November 1st

All articles should be submitted directly to the Editor daphne.bowden1@bigpond.com

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COVER PAINTING

Meadow Argus (*Junonia villida*) – painting by Lois Hughes



FROM THE PRESIDENT

As the newly elected president I am acutely aware of the strong foundation my predecessor Ross Kendall has created during his 9 years as president. Thank you Ross, I know I have big shoes to fill!

My short time as a member of the club and as a committee member has already shown me the dedication of the committee members both old and new who often work many long hours behind the scenes to ensure the club's ongoing success. I thank the members for electing me and am looking forward to working with you all in my new role.

The Butterfly and Other Invertebrates Club is special due to the diversity of interests amongst its members who are all linked by a common interest in insects (and spiders!). Many members contribute their time at events, ideas and magazine articles, not to mention artwork and photography, to the club. Contributions by any members are welcome and appreciated so please continue to offer your input no matter how big or small.

I myself have had the privilege of working as an entomologist both in Australia and overseas for a large part of my working life. My work was primarily on pest and predator interactions. These days my primary interest is in moths and silk production as well as educating the general public on the beauty, diversity and usefulness of insects.

This year is already proving to be exciting with the planning of more regular outings for club members, working on an improved website and the development of a new logo. Our next planning meeting is 8th August. Any members (new or old) are most welcome to come along and get involved.

Marie-Louise

IN THIS ISSUE

Meadow Argus (<i>Junonia villida</i>) (Lepidoptera: Nymphalidae)	4
President's report to AGM 2015.....	6
Life history notes on the Meadow Argus, <i>Junonia villida</i>	7
Infestation of Cryptocephaline Beetle Larvae	11
Life history notes on the noctuid moth <i>Basilla solomonensis papuana</i>	12
Homalictus bee – <i>Homalictus urbanus</i>	16
New Distribution Records for Hesperiine Butterflies in Australia	17
My Favourite Palynivore	32
More on Summer Butterflies	36
A Tribute to Presidents Past	38
In the Garden	38
You Asked – Granny's Cloak moth.....	39
Processionary caterpillars <i>Ochrogaster lunifer</i>	40
Meadow Argus sign.....	42
BOIC Programme	43



CREATURE FEATURE

Meadow Argus (*Junonia villida*) (Lepidoptera: Nymphalidae) – Lois Hughes

Often the first butterflies to welcome us in Spring here at Mt. Cotton, in Redland City, Queensland, are the Meadow Argus. This last season was no exception. In fact many species of butterflies were here in abundance and widely reported in many areas of South-east Queensland.



Meadow Argus, in the sunshine, feeding with the wings open

The Meadow Argus is easily recognizable both for its distinctive colouration and unique habits. Its flight is fast and fairly close to the ground, interspersed with brief periods of gliding, before alighting, wings outstretched, to bask in the sunshine. They spend considerable time on the ground. Our gravel path is a favourite spot to which they repeatedly return.

Fast and furious “dog fights” ensue between rival males, sometimes three or four spiralling crazily upwards as they seek to establish territory or drive off intruders. Their cryptic underwing colouration is the perfect disguise when they rest with wings closed.

There are some minor variations in pattern, colour and size with a number of subspecies recognized over its considerable range according to Braby (2000). Its distribution ranges from the Christmas and Cocos-Keeling islands, mainland New Guinea and adjacent islands, virtually the whole of mainland Australia and eastern Tasmania, Lord Howe and Norfolk islands, New Zealand and many islands of the south-west Pacific.

It is a welcome and common garden visitor and, because it has a large number of host plants on which its caterpillars feed, is found in a wide variety of habitats. Migrations have been recorded but these would seem to occur sporadically and are not well documented. The butterflies remain in our location during their breeding season.

A medium sized butterfly, with a wingspan between 40-43 mm, it breeds on a wide variety of exotic plants as well as natives. The exotics include *Antirrhinum* species (Snapdragons), *Centaurium* species, *Hygrophila costata*, *Plantago* species (Plantains), *Portulaca oleracea* (Pigweed), *Verbena bonariensis* (Purple Top), *Verbena officinalis* (Common Verbena) and *Verbena rigida* (Veined Verbena).



Local natives include *Goodenia rotundifolia*, *Hygrophila angustifolia* (Karamat), *Portulaca australis*, *Scaevola aemula* (Fanflower) and native plantains. This list is not exhaustive. Braby (2000) has additional plants listed which may be appropriate for other areas.

On numerous occasions I have found larvae on *Barleria cristata* (an exotic with lavender trumpet-shaped flowers), but haven't yet bred them through to verify this. This plant, sometimes erroneously referred to as Philippine Violet, is in the Acanthaceae family, making it a relative of the native *Hygrophila* and as such is probably a suitable host plant. We have a large colony of Tiny or Dainty Grass-blues (*Zizula hylax*) which breed prolifically on *Barleria*, a tough, drought-resistant ground cover, making it much easier to grow than *Hygrophila*, the Dainty's local host plant. However, on the downside, *Barleria* can become invasive due to its hardiness and the fact that it has exploding seed pods which scatter the seed over a wide area.

I have also observed a female Meadow Argus ovipositing on Carpet Weed or Fog Fruit (*Phyla nodiflora*) a mat-forming perennial ground cover, with attractive dainty white flowers.

Most often I find caterpillars on Common Verbena (*Verbena officinalis*), a weed which is dotted throughout our paddocks and in my herb garden! Every time I decide to dig them up or cut them down I find caterpillars present. I am not sure what the attraction is but the butterflies appear to favour these particular plants.

The black caterpillars, with soft, branched spines, have a peculiar habit of wandering from the plant to rest on the ground, sometimes well away from their home, which is certainly hazardous for them as I tend the garden!

Another weedy Verbena, *Verbena bonariensis* or Purple Top, grows along with *Verbena officinalis* here but isn't as favoured by the butterflies, maybe because its leaves are tougher. In captivity however the caterpillars readily accept this species.

Despite their tiny size, the flowers of both weeds are a nectar source for small blue butterflies and migrating Caper White butterflies. I found the following in an old "Diggers Gardening Club Catalogue" which listed *Verbena bonariensis* thus – "This beauty floats hundreds of amethyst heads of bloom as it blends with its garden companions". The article's accompanying photo portrayed a much more floriferous head, compared to the tiny sparse flowers on our plants. If any of our members in southern states have knowledge of, or experience with, this plant, and it is as described, I would be interested in obtaining some to plant in our garden.

Another very common weed, *Lantana camara*, is listed in Braby (2000) as a host plant but not seen here as such. It is also utilized as a nectar source, so this combination, as well as lantana's wide distribution, would certainly contribute to the proliferation of the butterfly in many locations.



In conclusion it would appear that a number of plants which classify as weeds have insured that this much loved garden visitor remains a common sight. We should value these plants while at the same time keeping them within reasonable bounds.

Photos Erica Siegel

References:

- Braby, M.F., 2000. Butterflies of Australia. Their Identification, Biology and Distribution – Volume 1, CSIRO Publishing, Melbourne
- Kleinschmidt, H.E. and Johnson R.W., 1977. Weeds of Qld., DPI
- Moss, John T., 2010. Butterfly Host Plants of S.E. Qld. and Nthn. NSW, 3rd edition, BOIC



Meadow Argus imbibing nectar from
Lantana camara

PRESIDENT'S REPORT TO AGM 2015

Another year has flown by and the club is about to enter its 21st year of existence. The celebration of our 20th year was marked by the publication and distribution of complimentary copies of a 2015 calendar featuring a selection of paintings created by Lois Hughes for various cover stories in past editions of "Metamorphosis Australia". Several hundred extra copies were sold and this helped to defray the significant cost of printing and postage. The inclusion of some articles from the "old" Newsletter in editions of the magazine during our 20th year is an interesting link to our past.

The success of our magazine is a wonderful reflection of the interest and dedication of the many contributors. Many subscribers to the more "professional" publications now acknowledge the quality of the articles.

Much of the success of our club has come from the quiet dedication of Daphne over all the years. I thank her for the wonderful work in preparing each quarterly edition of our magazine. Some articles arrive unsolicited but others are the result of her gentle diplomacy. Preparation of the magazine also entails much more than arranging those articles and images using MS-Word and emailing the final product to the printers. The final text and layout of an article often involves several exchanges, sometimes by phone, often by email, with the author and specialists in their particular field. John Moss is often consulted. Peter Hendry helps to ensure that images supplied are tweaked to achieve the best outcomes. It is a rare event if a grammatical, spelling or punctuation error escapes Daphne's vigilant eye.

Daphne maintains the database of our membership. She is usually the first person contacted with questions or requests to find the identity of a particular bug and



through her many links to experts is able get a speedy response back to the enquirer. I checked my computer's "Daphne in box" this morning. There are 1998 messages that have arrived since mid 2008. How many more went to other recipients?

John continues to be a great ambassador as he maintains connections with many members of like-minded organisations while Rob keeps our financial records in their usual immaculate order. We continue to be privileged to be able to appreciate Lois's beautiful and accurate paintings for the magazine cover. I thank Alisha, Richard and committee newcomers Marie-Louise and Jill for their support during the year. Elaine Allison has begun to contribute her paintings of butterflies which are much admired.

In September, I reported on the success of our display at the Brisbane Exhibition and thanked the many folk who manned that display. Similar displays at Kumbartcho, IndigiScapes and the SGAP annual Spring Flower Show often have intangible results but are an essential part of the club's aims. Our book "Butterfly Host Plants of South-east Queensland and Northern New South Wales" continues to sell well with around 800 copies sold since the release of the 3rd edition in late 2010. The long awaited Mistletoe book that has consumed thousands of hours of both John's and my time will finally be printed this year.

In recent times we have failed to provide the opportunity for newer members to participate in field trips. I believe that your new committee will address this issue.

The nine years of my presidency have provided me with many opportunities to make a positive contribution and I am sure that BOIC will continue to prosper in the future.

Best wishes

Ross

ITEMS OF INTEREST

Life history notes on the Meadow Argus, *Junonia villida* (Fabricius, 1787) Lepidoptera: Nymphalidae – Wesley Jenkinson



Meadow Argus (*Junonia villida*)

Photo Russel Denton

This species is another one of Australia's very well-known and well documented butterflies. Its distribution has been recorded across the continent and the lower regions of eastern Tasmania. The adults frequent a wide range of habitats particularly open woodlands and grasslands where the host plants are commonly growing. They are also a common visitor to suburban gardens. It is one of a limited number of butterflies that have been recorded in the dry inland

regions of Australia and adults tend to avoid more densely vegetated areas such as wet



closed forests, but may frequent the margins particularly when searching for nectar. They are migratory and can number in their hundreds when this occurs.

The adults are rapid fliers and typically land on bare ground, rocks or low growing vegetation and become very active from mid-morning to late afternoon in hot sunny conditions but settle rather quickly during cloudy conditions. During warm sunny periods they rest with their wings open towards the sun and in very hot sunny weather tend to have the wings closed, facing towards the sun. This would no doubt help to assist in deflecting any additional heat captured by their wings. They have a very distinctive flight, gliding quickly with the wings open in a flat plane, followed by a few rapid wing beats. Males occasionally defend small territories chasing off rival males. Both sexes are readily attracted to a wide variety of small native and introduced flowers and when feeding, the wings are often open to reveal their pretty upperside colours. During migrations, flight is around one to two metres, or much higher over obstructions such as rows of trees and buildings. When in search of nectar, again they can be observed at the top of the tallest eucalypts feeding on blossom.



Meadow Argus (*Junonia villida*)

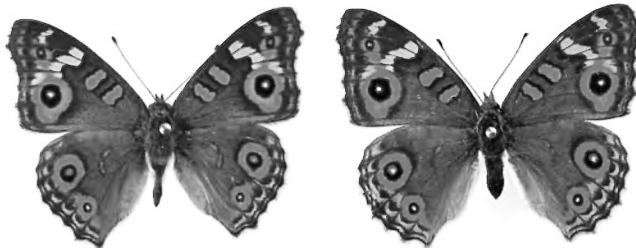
Photo Russel Denton

Whilst in flight this species can easily be confused with the Australian Painted Lady (*Vanessa kershawi*) which is also migratory and is very similar in flight behaviour, general colour and size. The two species often occupy similar habitat and occasionally the timing of migrations can overlap. Compared to *J. villida*, *V. kershawi* lacks any eyespots on the wings and has a much more mottled pattern on the hindwing.

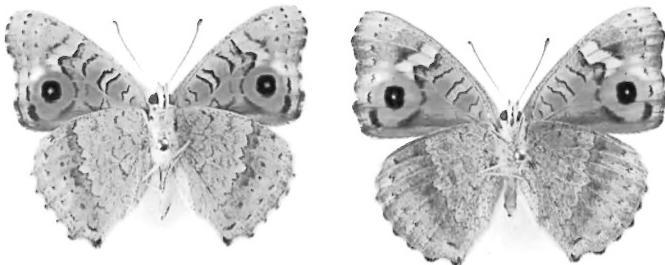
The species shows slight weak seasonal variation. Dry season specimens chiefly have a more pronounced postmedian band on the hindwing underside with a slightly darker ground colour. The upperside eyespots are often slightly smaller in these specimens (Braby, 2000). To determine the sexes, females are usually larger, with the hindwing termen more rounded and the forewing apex less pointed (Braby, 2000).

Wingspans for the pictured adult specimens are: male 42 mm and females 44 mm.





Junonia villida calybe (Godart, 1819) Meadow Argus
Images left to right: male, female



Junonia villida calybe (Godart, 1819) Meadow Argus
Images left to right: male underside, female underside

A contributing factor for the success of this species is that it utilises a wide variety of native and exotic herbaceous host plants. The following families listed by various authors are listed in Braby 2000, Acanthaceae, Asteraceae, Convolvulaceae, Dipsacaceae, Gentianaceae, Goodeniaceae, Lamiaceae, Plantaginaceae, Portulacaceae, Scrophulariaceae and Verbenaceae.

Ovipositing females fly slowly around the host plant often settling on the ground then walking onto the host plant. One female observed walked around in circles on the host plant before curling her abdomen onto the leaf surface. Eggs were laid singly and were positioned near the edge on the leaf surface, on both the upper and lower sides. Females ovipositing have been observed at Beaudesert during late September in full sun by 10.00 am in the morning and also mid-afternoon during February. Females appear to have a preference to lay their eggs on small plants at ground level rather than taller plants.



Freshly laid egg

During September 2007, an egg was collected from an exotic plant (or weed) known as Purpletop (*Verbena bonariensis*) growing at my residence in Beaudesert, Queensland. The larva was raised through to an adult on this known host. The egg was approximately 0.8 mm high x 0.7 mm wide, green, barrel shaped with 13 coarse longitudinal ribs also showing faint transverse lines.



In captivity the larva consumed most of the eggshell soon after emergence. The early instar fed near the base of the leaf, chewing the lower leaf epidermis. The later instar then fed eating sections from the outer edge of the leaf. It had a preference to feed close to the ground rather than higher on the host plant. It sheltered below leaves at the base of the host plant during the day and was observed feeding during daylight, at dusk and during the night. The larva completed five instars and attained a length of 38 mm.



1st instar larva



2nd instar larva



3rd instar larva



4th instar larva



5th instar larva



Pupa lateral view



Pupa dorsal view

The brown coloured pupa, measuring 17mm in length, was located below a stem of the host plant. It was attached with silk only by the cremaster. Under natural



conditions the larvae often leave the host plant and pupate in a sheltered position below a leaf on a nearby herb or shrub.

The total time from egg to adult was just over one month, with egg duration 3 days, larval duration 23 days while pupal duration was 7 days.

Within the new boundary of the Scenic Rim Regional Shire south of Brisbane, I have records of adults from all months of the year. Flight times appear to vary, however in this location they are generally more numerous from late spring to early summer, late summer and autumn. In south eastern Queensland during the hot summer months, the adults can be numerous west of the Great Dividing Range. My Beaudesert records indicate adults of both spring and autumn migrations are all generally heading in a southerly direction. No migrations have been recorded heading towards the north.

Photos (except where already credited) Wesley Jenkinson

Reference: Braby, M.F., 2000. *Butterflies of Australia – Their Identification, Biology and Distribution*. vol 2. CSIRO Publishing, Melbourne

Infestation of Cryptocephaline Beetle Larvae – Margaret Greenway

During March and early April, 2015, I found thousands of these encased (8 mm in length) larvae floating on the surface of my swimming pool and clogging the skimmer box. At times the pool surface was black. Initially I thought they were falling into the pool from the overhanging Eucalyptus trees. I sent the photograph to Daphne who forwarded it to Martyn Robinson and Chris Reid at the Australian Museum. Martyn and Chris identified the larvae as those of a chrysomelid beetle. They make their case out of faecal matter. Chris thought the larvae were probably a species of *Cadmus*, subfamily Cryptocephalinae: family Chrysomelidae (leaf beetles). He suggested that the larvae were probably crawling into the pool so I undertook some ‘on ground’ investigations.



Cryptocephaline Beetle larvae *Cadmus* sp.



Indeed I found that the larvae were crawling into the pool – mainly at night, although they were also active during those rainy dull days. In exposed areas e.g. pool pavers, they seemed to ‘hide’ (under dead leaves) when the sun came out. They were also in abundance in the leaf litter and I was able to observe them feeding on dead leaves and the bark of twigs; they were also feeding on fresh eucalypt leaves that had fallen on the ground and appeared to have voracious appetites. Fallen eucalypt twigs had been completely stripped of leaves and bark.

Chris had previously observed, and recorded (Reid, 1999), large infestations of cryptocephaline beetle larvae in a plantation plot of *Eucalyptus fraxinoides* growing in a subalpine region. Densities of larvae up to 1000/m² were found on the forest floor, and were “skeletonising leaves and decorticating twigs” (p201).

What is so amazing to me is that I have never seen these larvae before, and I've lived at the bush block for 25 years.

Acknowledgements: Dr Chris Reid and Martyn Robinson at the Australian Museum

Photo Margaret Greenway

Reference:

Reid, C.A.M. (1999). Eucalyptus seedling herbivory by a species of *Cadmus* Erichson (Coleoptera: Chrysomelidae: Cryptocephalinae). Australian Journal of Entomology 38: 201-203

Life history notes on the noctuid moth *Bastilla solomonensis papuana* (Holloway, 1979) [Lepidoptera: Noctuidae: Catocalinae] – Graham McDonald

Introduction: The moths of the genus *Bastilla* are generally a large species and often have a characteristic white or pale coloured band running from the costa to the dorsum near the centre of the forewing.

They are also characterised, along with some other genera in the *Parallelia*-complex, by a trapezoid or triangular area subapically based on the costa and defined by the anterior sections of the postmedial and submarginal fasciae, bridged by a line along vein M1 (Holloway and Miller 2003).

They are normally found in the tropical or sub-tropical areas of the continent and rarely in the arid interior.

Common (1990) states that this sub-species occurs in Australia from Cape York to northern New South Wales and is also found in New Guinea. Holloway and Miller (2003) add the Northern Territory to this distribution.

The moth referred to in this study was one of a number, collected as larvae on their local host plant, raised to adulthood and photographed in Mudgeeraba, South-east Queensland.



Synonyms: *Parallelia solomonensis papuana* (Holloway, 1979)
Dysgonia solomonensis (Hampson, 1913)
Catocala fusca (Scott, 1891)
Dysgonia fusca (Scott, 1891)
Dysgonia papuana (Holloway, 1979)

Other sub-species not found in Australia are:

Bastilla solomonensis bicacuminata (Holloway, 1979) which is found in the Solomon Islands, Bismarck Islands and in New Caledonia.

Bastilla solomonensis hebridesia (Holloway, 1979) which occurs in Vanuatu.

Host plants: The larvae of this moth feed on the leaves of *Breynia oblongifolia* (Family: Phyllanthaceae), (Common, 1990 and Holloway & Miller, 2003) (Figs 1 & 2).

This plant is generally seen as a shrub to three metres, but is usually much less.

It can have a suckering habit, particularly if the roots are disturbed.

Common names for this plant include Breynia, Native Coffee Bush, Dwarf's Apple and Willgar.



Fig. 1

Breynia oblongifolia occurs in every Pastoral District of Queensland with the exception of Gregory North and Gregory South, both in the channel country. The plant is also found in New South Wales, Northern Territory, New Guinea, Malesia and Melanesia.

This plant can be found in a number of vegetation types, including rainforest types, sclerophyll forests and in heath.

Left – Fig. 1 *Breynia oblongifolia* fruit
Below – Fig. 2 *Breynia oblongifolia* flowers



Fig. 2



Life history: The larvae of this moth (Figs 3 & 4) rest on the stems of *Breynia oblongifolia* during the daylight hours. They generally feed at night. When disturbed, they will contort their body and drop to the ground under the plant. The larvae are ‘semi-loopers’. They have lost two of the five pairs of prolegs, (false legs which are fleshy and unjointed) with another pair reduced to stumps. This enables them to move by drawing the rear end to the head and then advancing the head. Reduced prolegs allow the body to bend upwards further than it would normally, so covering a greater distance in one move.



Fig. 3

Early instar



Fig. 4

Late instar

Four larvae were collected at an early instar stage when they were 20 mm long. Over the next two weeks they grew to 40 mm long and then pupated. A cocoon was constructed from the leaf litter supplied. Several pieces were held together by silken strands and then the pupal chamber was lined with fine smooth silk (Figs 5 & 6). The pupa was 25 mm long and covered with a grey coating which was easily rubbed off when touched.



Fig. 5

Pupal shelter



Fig. 6

Pupa

Pupal duration was 20 days from March 26 to April 16, 2015. The adult moths which emerged had a wingspan of 60 mm, and were released after being photographed (Fig. 7).



My records indicate that the adults are active from January to the end of April with the peak in late March to mid-April.

Important note: A perusal of Holloway and Miller (2003), indicates that the closely related (sibling) species in the *joviana* group (to which this subspecies belongs) are so similar that only dissection of the male genitalia could separate them conclusively. However, they

also state that one of these, *B. joviana* subspecies *curvisecta* (L.B. Prout, 1919), known from "North-eastern Queensland", is lacking certain characteristic dots on the forewing, which are present in *B. s. papuana*. Consequently this should exclude the former from the differential diagnosis. Furthermore, another in this group, the newly erected species *B. nielseni*, Holloway & Miller 2003 (morphologically very similar to *B. s. papuana*) is only known conclusively from PNG, Sue Island in the Torres Strait and possibly from Bamaga on the tip of Cape York, effectively excluding it from the differential diagnosis.

Since the Holloway and Miller paper, further work by others on the superfamily Noctuoidea has resulted in some authors moving Catocaline moths, such as this species-group, into family Erebidae, sub-family Erebinae.

Acknowledgements: I thank Ted Edwards, John Moss and Peter Hendry for their helpful comments on earlier versions of the manuscript.

Photos Graham McDonald

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- Common, I. F. B. 1990. *Moths of Australia*. Melbourne University Press
- Holloway, J.D. & Miller, S.E. 2003. The composition, generic placement and host-plant relationships of the *joviana*-group in the *Parallelia* generic complex (Lepidoptera: Noctuidae, Catocalinae). *Invertebrate Systematics* 17, 111-128. CSIRO Publishing

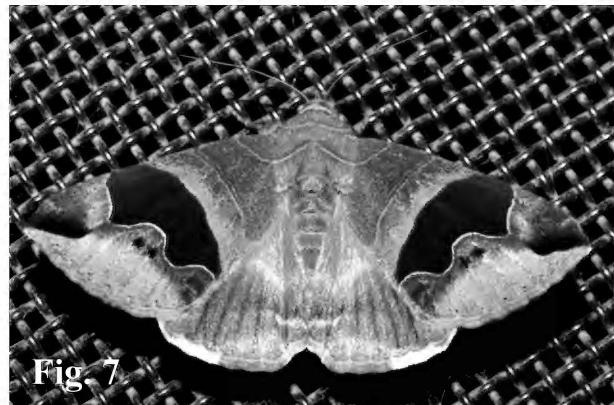


Fig. 7

Bastilla solomonensis papuana



Homalictus bee – *Homalictus urbanus* - Erica Siegel

There are about 40 species of *Homalictus* bees and they are found in all states of Australia, both along the coast and inland.

Although very small, ranging from 5 mm to 8 mm (the female being longer), the glittering *Homalictus* bees come in a dazzling array of colours; ‘golden blue’, ‘coppery red’ and ‘green tinged with purple, red or gold’ are just a few of the colours listed by scientists. They carry pollen on unusually long, branched hairs under the abdomen.

Homalictus bees dig complex branching nests in the ground. Tiny oval brood cells are constructed in the nest shafts off the main shaft usually at the end of lateral tunnels. Many females may live together in each nest, taking turns to guard the narrow nest entrance. One nest was found to be occupied by over 160 females! The female lays a single egg onto a ball of prepared food, then seals the brood cell up and starts constructing the next cell.

Male *Homalictus* bees roost at night in the open, clustered together like some other solitary native male bees.

Homalictus bees forage on a wide variety of flowers from many different genera such as *Angophora*, *Acacia*, *Bursaria*, *Callistemon*, *Eucalyptus*, *Leptospermum*, *Melaleuca*, *Pittosporum*, *Salvia*, *Tristania* and *Wahlenbergia*. They will also visit flowers from the plant families Proteaceae, Xanthorrhoeaceae and the mistletoes but show a preference for the Myrtaceae.

Homalictus bees can be infested by mites (Sarcoptiformes) and attacked by parasites (Strepsiptera).

Photos Erica Siegel

References:

Dr. Anne Dollin, Australian Native Bee Research Centre www.aussiebee.co.au

Dr. Michael Batley, Australian Museum

Dr. Ken Walker, Revision of the Australian species of the genus *Homalictus* Cockrell, Memoirs of the Museum of Victoria, p105 Biodiversity Heritage Library





Images 1, 2, 3, and 4 - Homalictus bee – *Homalictus urbanus* on *Salvia*

Image 5 – *Homalictus urbanus* with *Tetragonula* (formerly *Trigona*) *carbonaria* on *Salvia*

New Distribution Records for Hesperiine Butterflies (Lepidoptera: Hesperiidae: Hesperiinae) in Australia –

Kelvyn L. Dunn

Summary

This paper documents 36 new locations in Australia for nine (9) species of hesperiine butterflies. Each record is from a location that falls outside the boundaries of the species' distributions, as indicated on the range-filled maps provided by Braby (2000). The report also discusses relevant new locations discovered by others since 2000, namely those that lie close to any listed in this paper; yet, in doing so it does not reiterate historic distributions that underpin Braby (2000). The many new locations



for the species tabled provide ongoing evidence that there remains much to learn about the spatial distribution of skipper butterflies, particularly in remote areas of western Queensland and western New South Wales.

Introduction

Skippers belonging to the subfamily Hesperiinae can be very inconspicuous in the field and when found, may not be seen for long enough to be identified, particularly when using methods outside of the traditional collecting approach. Their brisk flight, small size and sombre, often dappled colouring jointly lower their visual profile on the wing, and because of this, Murphy (2011) unashamedly argued and demonstrated that many (or even most) skippers will be overlooked by casual observers or inexperienced biologists making records of species presence. This has almost certainly been a long-standing issue spanning many decades (albeit usually left unmentioned in species inventories) and its outcomes, in terms of information loss, are more than obvious today. Indeed, it is the case that the known distributions for even some of the more widespread and common hesperiines of the inland are still very patchy and highly fragmentary (see maps in Braby 2000 as examples), when compared with other butterfly groups. Undeniably too, the distributions of many species of butterfly (not just skippers) are noticeably under-representative beyond the coastal and sub-coastal regions, areas where most butterfly fieldwork is repeatedly done (Dunn 2010, 2014a); hence a lack of broader survey effort has worsened this. Together, the low frequency of encounters (most of those seen in the outback during my surveys were at flowers, which can be seasonally sparse during hotter months) and their furtiveness in the field (when patrolling and perching) have contributed to the spatial knowledge deficiency evident among the various skipper species nationwide, including this particular subfamily.

Complicating matters, the adults often require a good measure of expertise to identify them so it is best to retain vouchers to ensure quality information is gathered. Where this is not achievable some field encounters may need to be discarded – an approach actioned by Franklin et al. (2005, p.2) who wrote, concerning some of their own observations in the Northern Territory, “*We have excluded records where there might be a reasonable call for a confirmatory voucher specimens (e.g. many Hesperiidae)*”. Others have chosen to indicate measures of uncertainty attached to particular records – more often than not the records may be correct anyway and may be useful in the future when more knowledge comes to hand – or they may have listed them at a higher classification (as I have done for some in this report). Either means acts to protect the baseline knowledge from contamination, and future authors can discard those recorded less reliably if they wish to. That said, because of the identification concerns as well as the other issues discussed, it seems reasonable to suppose then that many insect enthusiasts, who occasionally visit remote areas of Australia and who use only field observation and/or photography for their fact-gathering purposes, may pay less attention to this particular group, resulting in even less incoming information.



My field experiences has shown me that the observation method (including photography) does not guarantee as complete a list as does traditional netting and in hand examination. Handling and retention has long been argued as a reasonable call for many of the Hesperiidae and Lycaenidae (see Dunn 1994 p.72, Franklin *et al.* 2005 p. 2 (as quoted above), Dunn & Franklin 2010 p.90, Dunn & Field 2012 p.27). So to maximise the number of useful records obtained during the outback field surveys, and to achieve records hastily (as much land coverage was involved), I utilised the traditional collecting approach for such groups, wherever able. Where trapping was not allowable, photography of settled adults after persistent watching often proved satisfactory (when considerable time was available for this task), but this fact-gathering approach also requires knowledge of characters that distinguish the species so that those images achieved will contain the required information for the purpose.

Methods

I utilised a roadside explorative approach that involved counts of species (usually as adults) seen at numerous sites along major inland highways and byroads. The survey methodology described previously (see Dunn 2015 and earlier papers in the series) equally applies to this piece. Similarly, the method used to measure distances and define locations to precision of within a kilometre of the actual site (as presented in the Table) has also been described (see Dunn 2013a) and is not reiterated. In addition, extended discussion and other recommendations to help describe locations effectively and to avoid ambiguity are detailed elsewhere (see Dunn 2013b) and that source will provide further reading, if required.

I identified most of the hesperiine adults encountered by handling. In many cases, I retained those adults as **vouchers** (69.2%), irrespective of whether they were also photographed in the field. Hence, the percentage of vouchers in the Table is very much higher than the usual frequency for all records of butterflies on the trips concerned because, firstly, skippers are difficult to identify in the field and, secondly, because the table is selective data and lists only those records that represent new locations. Very occasionally some adults were caught and examined to confirm their identification and then released (**Rel.**) (2.6%). Where images are included, a superscript links the photos (usually video frames) to the records concerned. Records that standalone as image-only (meaning the specimens were not retained as vouchers) are marked as '**Photo**' (5.1%). The nine (9) encounters (23.1%) recorded by observation-only are marked as '**Obs.**'; for six of these the identifications were certain (Category 1). In each case, I recognised sufficient characters to achieve that level of confidence. However, three observations were to a level of 'almost certain' (Category 2) as insufficient evidence was obtained on which to identify the larval species involved. Finally, two records are to the level of genus only; in each case, insufficient characters were seen to make a finer identification before the adult was lost from sight.



Results and Discussion

The Table lists 39 records of 9 species from 36 new locations (arranged from north to south), across mainland Australia; all sites fall outside the boundaries defined by Braby (2000) for the species concerned and so are new on that criterion. I gathered most of these new records during two extensive trips to and from the Gulf Country in the springs of 2011 and 2012. The first trip was more productive, contributing 59% of the new locations (of hesperiines) obtained in those two data sets; both seasons had hallmarks of being very productive events (see Dunn 2011a,b) and this likelihood gave the needed incentive to undertake these outback surveys. Two records included in this report (one from eastern Queensland and one from southern Western Australia) were from earlier field trips (during unexceptional seasons), and although each provides just a minor extension, both are new (according to definitions established) and not previously mentioned in later literature. In addition, an important new record from northern Victoria now provides the southern limit for *Taractrocera ina* in eastern Australia. Some records considered worthy of individual comment due to their interesting circumstances, whether they be biological or behavioural in focus, include a superscript indicating a note is available. These notes also include references to encounters by other workers in the last decade or so, where their published new locations fall close to those listed in this report.

For some species, the new locations link or partially link major areas of occurrence and add to available knowledge, giving insight into a much broader distribution in places. The accumulating records of the Yellow Palmdart, *Cephaelis trichopepla* from the Gulf Country are one example. Common and Waterhouse (1981) had inferred, many years ago, that it probably occurs naturally across the coastal and near coastal region, but at that time supportive data were unavailable. The new records since the late 1990s collectively help bridge the obvious gap for this widespread species, albeit it likely occurs only patchily along watercourses for much of the Gulf region. Similarly, for *Taractrocera ina* and *T. anisomorpha* the scattered new records from northwestern and western Queensland provide evidence of what is very likely to be, and what has long been suspected as (see range fill maps in Common & Waterhouse 1981 for these species) a continuous distribution across much of the inland.

In other cases, the new information indicates patchy occurrences that would likely be biogeographically separate from the main areas of distribution. Those records of *C. trichopepla* from residential areas, remotely inland from the main coastal presence, are of this category. They are almost certainly linked to parkland and garden plantings of native and exotic palms, on which the larvae develop (Braby 2000 and references therein). Indeed, it is probable that these disjunct populations were fully human-assisted sometime during the last two or three decades; meaning, the butterfly life history was probably imported with the palms themselves as part of the nursery trade, rather than being the result of natural dispersals from the north or east. Although the Yellow Palmdart may now be a permanent feature in some outback towns in western



Queensland, it seemed that population numbers were low (at least during my visits in spring), despite a copious quantity of larval hosts available in gardens and partially shady parklands. In the Mount Isa area in particular, larval damage and juvenile fragments were only occasionally found during my targeted searches for both adults and live juvenile stages, so it would seem the species remains scarce in that region. No evidence of *C. augiades* was found in far western Queensland, although its juvenile stages as well have probably been transported repeatedly from the coastal belt into the outback region by the nursery trade, as has been the way of introduction elsewhere (Hutchison 1988, Crosby 1990). The region's climate may be too dry for that species and those palms grown in gardens and parklands are often inadequately shaded from the midday summer heat, which together does not provide the niche this former rainforest species favours (Dunn 1995).

The records of *Ocybadistes* in southwestern Queensland, particularly that of *O. flavovittata*, were rather surprising encounters in a region that one might suppose was too arid for this group. Searches along roadside drains where weedy flowers blossomed certainly assisted in finding those few individuals reported. Targeting this niche may have revealed additional records farther afield, had time been available for extended work on this group; beyond the drains, grass-dart skippers were usually unseen except in damp areas of woodland where native flowers were present. The suitable seasons then present may have created larger than usual populations that enabled detection of these two species, where otherwise they may be very rarely seen residents. Yet an alternative hypothesis stands that these particular records in the Charleville residential area may have been rare events of vagrancy (or subsequent temporary generations from an earlier vagrancy event), linked to consecutive wetter-than-usual seasons between 2010 and 2012. To improve our understanding of these spatial dynamics, I call for others to seek out evidence of juvenile stages of *Ocybadistes* in the Charleville district to help determine whether one or both species is a breeding resident in southwestern Queensland. It is also interesting, that in the same period a male of *O. flavovittata* was netted along the Murray River foreshore at Tocumwal, in southwestern NSW, and a number of adults of *Taractrocera ina* were taken very soon after in this area (Dunn & Field 2012); the latter species had colonised on the opposite riverbank. I later captured a female of *T. ina* farther south, on the Goulburn River, at 6km (beeline) ENE of Wyuna, in northern Victoria (see Table).

For the other hesperiines tabled, some of the extensions recorded may be minor but each provides evidence of a broader occurrence in the areas concerned. Most of the new records from eastern Australia (as well as a record from WA) link in to an inadequate knowledge of species' distributions – due to a lack of regular exploration by insect collectors – rather than because of any unusual or localised climatic conditions in parts of Australia for some of the years concerned. Each record adds insight into the distribution of those species of butterfly, particularly for the inland,



and helps fill knowledge gaps evident in their distributions (as based on the range-fill maps in Braby 2000).

Table - 36 New locations for species of Hesperiinae from beyond their known ranges in Australia

Species/Location	State	Geocode	Date	Format
<i>Taractrocera ina</i>				
25km W of Hughenden Meteor Creek, 15km WNW of Rolleston	Qld	20°52'S, 143°58'E	04 Nov 2011	Voucher ^{Note 1}
Nine Mile Creek, 14km N of Miles	Qld	24°26'S, 148°29'E	11 Nov 2011	Voucher ^{Note 2}
Tara River, at Hebel Goulburn River, 6km (beeline) ENE of Wyuna	Qld Vic	26°33'S, 150°08'E 28°58'S, 147°48'E 36°11'S, 145°07'E	15 Nov 2011 17 Nov 2011 31 Mar 2012	Voucher ^{Fig. 1} Voucher Note 3, Fig. 2
<i>T. anisomorpha</i>				
Torrens Creek (township)	Qld	20°46'S, 145°01'E	28 Oct 2012	Voucher ^{Note 4, Fig. 3 & 4}
25km W of Hughenden Carrols Creek, 46km NNW of Clermont	Qld	20°52'S, 143°58'E	04 Nov 2011	Voucher
39km E of Charleville, near railway bridge (on Road to Morgan)	Qld	22°28'S, 147°28'E	06 Nov 2011	Voucher ^{Note 5}
39km E of Charleville, near railway bridge (on Road to Morgan)	Qld	26°25'S, 146°37'E	30 Sep 2012	Voucher ^{Note 6, Fig. 5}
<i>Taractrocera sp. (ina or anisomorpha)</i>				
Express Creek, 86km NNW of Richmond	Qld	20°06'S, 142°49'E	29 Oct 2011	Obs. ^{Note 7}
<i>T. papyria</i>				
19km SE by S of Roma (via road to Surat)	Qld	26°41'S, 148°53'E	15 Nov 2011	Voucher ^{Note 8}
Mirrool Creek, 58km (by road) N of Hay	NSW	34°02'S, 144°50'E	19 Oct 2011	Voucher ^{Note 9}
Denmark (in vacant residential block in township)	WA	34°58'S, 117°21'E	21 Oct 2008	Voucher
<i>Ocybadistes walkeri</i>				
1.6km NE by E of Charleville (post office) at van park	Qld	26°24'S, 146°15'E	01 Oct 2012	Voucher ^(see Note 12)
Murrumbidgee River, 1km SE of Hay	NSW	34°31'S, 144°51'E	19 Oct 2011	Voucher



Nine Mile Reserve, 14km W by S of Hay South	NSW	34°33'S, 144°43'E	18 Oct 2011	Voucher ^{Note 10}
<i>O. flavovittata</i>				
2km NW by N (by road) of Cedar Creek Falls (due east of Proserpine, on Saltwater Creek Road)	Qld	20°24'S, 148°42'E	03 Nov 2012	Rel.
Lotus Creek Roadhouse, about 63km (beeline) W of St Lawrence Carrols Creek, 46km NNW of Clermont	Qld	22°21'S, 149°06'E	04 Nov 2012	Voucher
Theresa Creek, 10km N of Emerald	Qld	23°26'S, 148°09'E	07 Nov 2011	Voucher
Anakie (at town billabong)	Qld	23°33'S, 147°45'E	09 Nov 2011	Voucher
Takaraka camping ground, Carnarvon Creek, near Carnarvon Gorge	Qld	25°04'S, 148°16'E	12 Nov 2011	Voucher
2km WNW of Charleville (at Page St intersection)	Qld	26°24'S, 146°13'E	01 Oct 2012	Voucher ^{Note 12, Fig. 6}
<i>Ocybadistes sp. (walkeri or flavovittata)</i>				
Torrens Creek (township)	Qld	20°46'S, 145°01'E	28 Oct 2012	Obs. ^(See Note 4a)
<i>Suniana lascivia</i>				
Mimosa (Munall) Camping ground, Blackdown Tableland 'Expedition Range Crest' (at 890m a.s.l. as per signage), Blackdown Tableland	Qld	23°48'S, 149°04'E	07 Nov 2011	Photo ^{Note 13, Fig. 8}
			08 Nov 2011	Photo ^{Fig. 7}
	Qld	23°50'S, 149°05'E	07 Nov 2011	Obs.
			08 Nov 2011	Obs.
<i>Cephrenes trichopepla</i>				
Normanton, at drain near Travers Street	Qld	17°41'S, 141°04'E	12 Oct 2012	Voucher
Burketown	Qld	17°45'S, 139°33'E	10 Oct 2012	Obs.-C2 ^{Note 14}
Lawn Hill Creek, Adels Grove	Qld	18°41'S, 138°32'E	24 Oct 2012	Voucher ^{Note 15}
			25 Oct 2012	Obs.



5km N of Mount Isa (at van park)	Qld	20°40'S, 139°30'E	18 Oct 2012	Obs.-C2 ^{Note 16}
Pioneer East, Mount Isa (at van park)	Qld	20°43'S, 139°31'E	02 Nov 2011	Obs-C2 ^{Note 17}
1km S of Barcaldine (at van park)	Qld	23°34'S, 145°17'E	04 Oct 2012	Voucher
Blackall (in Lehman Park)	Qld	24°26'S, 145°28'E	26 Oct 2011	Obs. ^{Note 18}

Key to Table:

Note 1. A male of *T. ina* was netted at a flowering tree (probably a Whitewood, *Atalaya hemiglaauca* (Sapindaceae) from memory) growing in grassy open woodland on the southern side of the Flinders highway. It fed with three males of *T. anisomorpha* sometime between 12:10 and 13:10h AEST – the duration of visit. Other butterflies feeding with these skippers included a male of *Nacaduba biocellata*, a female of *Lampides boeticus*, several males and females of *Theclinesthes miskini*, an *Elodina* sp. (very likely *E. padusa*), and a few males of *Belenois java*. The weather was sunny and very hot by midday (Richmond, Qld, 90km to the west, had reached 34°C by 13:00h, with a maximum of 35°C later that day- WU 2015). Atkins et al. (2003) included this species in a list from the Warang Homestead area and nearby gorges of the White Mountains National Park, to the east of Hughenden. Atkins' personally surveyed during a scientific expedition in April 2000 and did not record this species on that particular visit, but that paper included records of the species (from separate visits, attributed to two other workers) from either the gorge area or Burra Range, or both. The supplementary record from the township is supportive of that earlier report from the National Park and expands upon it.

Note 2. A male *T. ina* was taken at a tall flowering herb, likely a *Verbena* sp. (Verbenaceae), in riparian woodland; it fed between 10:30 and 10:55h AEST.

Note 3. Field (2013) plotted this location for *T. ina* in his recent field guide but gave no comment concerning its newness at that time; an explanatory remark would have been useful as there was no published evidence of the species south of the Murray River. In addition, because that field guide contained a tiny sprinkling of unusual map plots for other species that are beyond their accepted ranges (with no underpinning evidence provided) some users of the guide may wonder if one or more of these plots are mistaken entries in that source database. At any rate, this particular one for *T. ina* is legitimately plotted and the full details are now provided for the first time (see also comments in introductory section).



Note 4. A few *T. anisomorpha* were seen to feed at flowers of *Tridax procumbens* (Asteraceae) growing near a water tank in a vacant residential block in the main street (at 20°46'10"S, 145°01'16"E) between 12:55 and 14:00h AEST; a male was retained. Atkins et al. (2003) included *T. anisomorpha* in a list from the Warang Homestead area and nearby gorges of the White Mountains National Park, to the north of Torrens Creek (township). Atkins' had personally surveyed during a scientific expedition in April 2000, and did not record this species on that particular visit, but that paper also included records of the species (from separate visits, attributed to three other workers) from either the gorge area or Burra Range, or both. The supplementary record from the township is supportive of that earlier report from the National Park and expands upon it. Other species feeding at these daisies in Torrens Creek included a male of *Eurema herla* (wet season form), a few males of *Zizina otis*, one or more males of *Acraea andromacha*, a few adults of *Ypthima arctoia* (see Dunn 2015 concerning that species) and three males of *Prosotas dubiosa*. (4a) In addition, an *Ocybadistes* sp. (either *walkeri* or *flavovittata*) also fed with the above, but the solitary adult (seemingly a female) escaped the net prior to its certain identification. Atkins et al. (2003) did not list any *Ocybadistes* species from the National Park, and it is outside the range-fill indicated on the maps by Braby (2000) for these two species. My field notes provided a tentative identification as “?*flavovittata*” based on the under-side markings seen briefly as it fed, but given the very close similarity of the females of these species such an identification is little more than a guess without the specimen in hand. An extended search revealed no others of this genus.

Note 5. A male and female of *T. anisomorpha* were taken at roadside flowers of *Tridax procumbens*, growing adjacent to riparian woodland at Carrols Creek crossing; the male fed between 13:50-14:40h AEST. Other species seen feeding at Tridax Daisy at this site included, *Zizina otis*, *Theclinesthes miskini*, *Lampides boeticus*, *Eurema smilax*, and *Belenois java*.

Note 6. A male and female of *T. anisomorpha* were taken at herb flowers of *Lobelia darlingensis* (Campanulaceae) growing on cracked mud in a small drainage area of an extensive floodway; they fed between 14:45 and 15:00h AEST.

Note 7. Terry Woodger (of Richmond, Qld) and I were carefully watching for various skippers and small lycaenids at this remote location when a single adult was seen briefly (by TW) as it fed at (undetermined) herb flowers in shrubby woodland between 09:30 and 09:45h AEST. The skipper, which was seemingly either *T. ina* or *T. anisomorpha* (the latter was more abundant in the broader area of western Qld and might be the best guess), escaped capture. We did not see it again despite our focussed search, lasting until 10:30h, at which time feeding by most other butterflies at various flowers



(including *Carissa*, *Terminalia*, and *Cullen*) had become infrequent or ceased. The weather was very hot for mid-morning, with a shade temperature of 36°C by 09:45h. (Richmond Qld, 86km to the south, had reached 33°C by 10:00h, with a maximum of 38°C later that day – WU 2015).

Note 8. An encounter with three adults of *T. papyria* resting on grass in the shade of a wattle in woodland during very hot weather in mid-afternoon (at 15:00h AEST) exposed a remarkable communal roosting event. The shaded area, which covered little more than a square metre beneath the shrub, sheltered some 20 quiescent butterflies, which included a few *Belenois java*, a few *Eurema smilax*, two *Lampides boeticus*, several *Zizina otis* (as well as the skippers)! In addition, a female of *B. java* was roosting about one metre up on the circa two metre high shrub and two or three adults of that species were flying in the vicinity (10-20m radius). All other butterfly species appeared to be roosting at that time; no others, including *Z. otis* – which is usually a routine patroller – were conspicuous in flight during a 15-minute survey of the site. The localised attraction of several species to the shade of this single shrub, rather than being randomly dispersed under various shrubs, seems unusual behaviour and hence noteworthy. When the adults were gently aroused (by slowly waving a hand about 30cm above them), they took to low flight but quickly resettled in the shady patch. It is possible it may have been a moist soak (which might offer increased humidity, which butterflies often hone into in the inland) but no feeding was taking place. The shade temperature at the site was 36.5°C with 20% relative humidity. (Surat Qld, about 60km to the south, recorded a maximum of 38°C that day with 10% maximum humidity – likely at that time of the day (WU 2015)). Another event of heat-related shade seeking, involving two adults of a single species of *Papilio*, was described in a preceding report in this series (Dunn 2013c).

Note 9. A few adults of *T. papyria* were seen feeding at *Verbena supina* (Verbenaceae) growing along the levy of a dam at Mirrool Creek crossing, in woodland. Feeding bouts were very irregularly spaced, with five to ten minutes between visits, and occurred between 14:05 and 15:35h AEDT (duration of visit and local time in NSW). When these happened, the solitary adult would visit just one or sometimes two flowers before departing. The coverage of flowers was quite extensive (about 20 metres along the levy) but nectar quantity may have been low at that time, which might account for the brevity (a few seconds only) of each foraging event. Netting just one example of the grass dart for a positive identification took an unusually long time because each sighting lasted a few seconds only (insufficient time to target and swing a net), after which the skipper would immediately return to the woodland; moreover the adults were wary and very difficult to approach, none was perching nearby. They fed alongside a single *Theclinestes*



serpentata and one *Zizina otis*, the only other species that fed during 1.5 hours at the site. Braby and Edwards (2006) recorded *T. papyria* from the Griffith district, in southern inland New South Wales; this new record from north of Hay broadens the known distribution westward at a similar latitude.

Note 10. Braby and Edwards (2006) recorded *O. walkeri* from the Griffith district, in southern inland New South Wales; the record from Nine Mile Reserve, near Hay, broadens the known distribution westward at a similar latitude.

Note 11. A female *O. flavovittata* taken at this location with *T. anisomorpha* was very likely a participant in the same feeding bout at flowers of *Tridax procumbens* (see Note 5), but my field notes do not indicate that I had seen it feed.

Note 12. A single male was taken feeding at an undetermined herb flower growing in a roadside drain in rural ‘wasteland’, just beyond the main township area. It fed between 10:30 and 10:45h AEST alongside *Lampides boeticus* and *Zizina otis*, both of which were abundant. Supportively, a number of unusual range expansions for various species of butterfly and moth were reported over the 2010-2012 period in southeastern Australia (Anonymous 2011, Dunn 2011a,b Halsey 2011, Dunn & Field 2012, Faithfull & Dunn 2012, Morton 2012, Hewish & Hewish 2013, Haywood 2014). This encounter near Charleville, like that of *O. walkeri* (this paper) and *Eurema hecabe* (Dunn 2014b) in this same region may be part of that phenomenon, linked to a series of wetter-than-usual seasons in the inland. The male, which I retained because it was required as a voucher for a species difficult to identify in the field, was cooled in a fridge to about 4°C. It was then placed on foliage of *Lobelia darlingensis* (as illustrated) on which I had hoped it might feed (feeding is desirable as it greatly eases field photography) however it chose not to, but instead basked for a few moments, enabling a clear photo of the sex brand nonetheless.

Note 13. Braby (2000) recorded *S. lascivia* from the Blackdown Tableland in the body text of that tome (based on his own field records) but the Expedition Range region was not marked on the accompanying range-fill map. Adults were locally common in the ‘Mimosa camping ground’ where they were frequently seen basking on up to one-metre-high leaves of Blady Grass, *Imperata cylindrica* (Poaceae) in late afternoon on both days. I have included this record to substantiate, by a fine location, the earlier one reported at the regional level.

Note 14. Empty larval shelters of a *Cephrenes* species, almost certainly created by *C. trichopepla*, were present on a Dwarf Date Palm, *Phoenix roebellini* (Arecaceae) growing in a residential garden off Sloman St. Further effort is required to substantiate the (very likely) presence of this species in Burketown.



Note 15. A male *C. trichopepla* was captured roosting on low foliage of a *Livistona* palm along Lawn Hill Creek between 09:00 and 10:00h AEST; it bore a strong odour of *Eucalyptus* or *Melaleuca* (Myrtaceae) flowers, no doubt from a foraging event that morning. A second adult was seen the following day about three metres above ground at a flowering eucalypt near the camping ground reception; it fed between 07:55 and 08:05h. This is certainly not the first report of this species from the Lawn Hill area but is supportive evidence of a wider distribution beyond Lawn Hill National Park, wherein Daniels and Edwards (1998) listed it from the Lawn Hill Gorge.

Note 16. Empty larval shelters of a *Cephrenes* species, almost certainly those of *C. trichopepla*, were present on various exotic palms, including *Chrysalidocarpus* sp. (probably *lutescens*) growing at the frontage of the Moondarra Caravan Park, about 5km (by road) N from the city centre. Further effort is required to substantiate the species' (very likely) presence there.

Note 17. Frond damage and small shelters created by larvae of *Cephrenes* were found on several garden palms in a van park in Pioneer East. Although no larvae were found at this site during two separate searches of about 40 minutes each (during early November 2011 and mid-October 2012), *C. trichopepla* is known to occur at Mount Isa. Some years ago I examined a specimen that Ian Faithfull had captured near the city centre, in the riverbed of the Leichardt, in May 1989, and which is in his collection. It seems the species is still present in the residential area, albeit scarce in spring (see also Discussion).

Note 18. Three larvae of *C. trichopepla* were found on *Washingtonia filifera* (Arecaceae) in parkland in Blackall; three males were reared, which emerged during November. One emerged at night, some minutes before 23:30h AEST; the times of the other emergences were not determined with precision, as adults were found already expanded when containers were periodically checked. Empty larval shelters, almost certainly made by this same species, were present on *Phoenix roebelenii* palms growing close by; both are previously recorded host plants.

Note 19. A solitary male of *P. lyelli* was collected whilst roosting in shade on understory foliage along the northern riverbank, sometime after 09:35h and before 10:30h AEST. The encounter of a male (which is easily identifiable to species, unlike some females) provides good support for the new distribution it underpins. This encounter adds to the earlier report by Pierce (2008) who recorded the species close by at Karumba, in the eastern Gulf Country. To the north, it is known from three sites in the Kowanyama district, on western Cape York Peninsula (Hancock & Monteith 2004).



Note 20. A female *P. lyelli* was captured whilst visiting large yellow flowers (with four squarish petals) growing adjacent to remaining water in the creek bed amidst riparian shrub-land, west of Richmond; she fed at these flowers sometime between 08:55 and 09:25h AEST (the duration of the visit). Despite careful watching, no other skippers were sighted but an aged *Euploea corinna* and two *Lampides boeticus* fed soon after at the same patch of (unidentified) flowers.

Note 21. A hill-topping male of *P. bada* was taken at the summit during a joint visit to the Eungella region with Michael Braby. This cusp record, marginally outside the distribution figured by Braby (2000), is important in defining the western limits at this latitude in the Burdekin region of northern Qld, and is included on that understanding.

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Fig. 1



Fig. 2



Fig. 3



Fig. 4

Fig. 1. *T. ina* male upper side – Tara River, Hebel, Qld.

Fig. 2. *T. ina* female upper side – Goulburn River, near Wyuna, Vic.

Fig. 3. *T. anisomorpha* male under side – Torrens Creek (township), Qld. (Video recorded feeding at *Duranta repens* – Verbenaceae in captivity)

Fig. 4. *T. anisomorpha* male under side – Torrens Creek (township), Qld. (Video recorded feeding at *Duranta repens* – Verbenaceae in captivity)





Fig. 7



Fig. 8

Fig. 5. *T. anisomorpha* male under side – 39km E of Charleville, Qld. (The proximal antenna is projecting towards lens and appears almost invisible.)

Fig. 6. *O. flavovittata* male upper side (showing sex brand) – 2km WNW of Charleville, Qld. (Placed on *Lobelia* and video recorded in captivity.)

Fig. 7. *S. lascivia* male upper side – Mimosa Camping ground, Blackdown Tableland, Qld.

Fig. 8. *S. lascivia* male under side – Mimosa Camping ground, Blackdown Tableland, Qld.

Photos Kelvyn Dunn

My Favourite Palynivore – Densey Clyne

Wandering around my garden I brush against a small plant and catch a tiny movement out of the corner of my eye. I scan the foliage; whatever I disturbed has disappeared. But what's that slight irregularity on one of the leaves? Got it! Yes, it's a living thing. An asymmetrical scrap of green lying at an angle on a leaf, with three long equally-spaced projections – a fine example of a disruptive posture combined with camouflage colour.





Early instar male

When I touch the leaf what springs into action is a tiny insect with quivering antennae that are at least four times its body length. It has curiously elongated mouthparts but it's clearly some kind of katydid. In fact it is my first encounter with a Balsam Beast, a baby one.

Why the name Balsam Beast? Well, not knowing its proper name I called it that because the shrub I found it on was

Impatiens sodenii, commonly known as

Bush Balsam. The other *Impatiens* that gardeners know as Busy Lizzie also grew untidily everywhere, especially around the bases of the giant Sydney Blue-gums (*Eucalyptus saligna*) and the Rough-barked Apple (*Angophora floribunda*) that bordered my Sydney suburban garden.



Specialised mouthparts



Male nymph feeding at Balsam flower

Soon after that first encounter I realised that the first-instar nymphs were descending on to the garden plants from the tree-trunks into which they must have been laid as eggs. The Balsam plants at the base of the trees were their first staging point and the flowers their first meal. Clearly these were pollen-feeding (*palynivorous*) katydids of the family Tettigoniidae, with mouthparts designed for probing into flowers.

That early encounter was the start of many years of fascinated discovery as I followed their growth and nocturnal activities. They became the subject of all too many close-up photographs and a lot of scrappy notes made during torch-lit garden patrols.



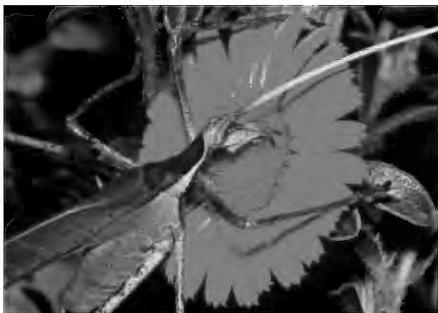


Young male with developing wings

At every stage this katydid was intriguing. As part of its daytime camouflage the young katydid paired its long legs and antennae together and held itself at an angle that disrupted the telltale insect shape. Later as it grew to what you might call the lanky teen stage it would spend the day sprawled across a leafy stem, still well camouflaged but now with obvious wing buds and up-tilted tail end.

Females were identified by the growing ovipositor while the slightly smaller male had a pair of brown spots on his back.

The adults were busy feeding at night on a variety of flowers, often on gum blossom too high up for me to see though the males could be located by their shrill 'zzzz'. They were elegant insects with their long legs, slender bodies, high-angled wings, enormously long antennae and almost bird-like faces. I likened them to woodland sprites and later this influenced my naming of them.



Feeding on daisy pollen



Feeding on *Lantana* sp. in the garden

I had seen and photographed a pair mating but could only guess about the female's egg-laying strategy. Eventually I captured a gravid-looking female and installed her in a cage with a section of bark from an angophora tree. To my delight she soon climbed on to it and inserted her ovipositor into the bark. Foolishly, I never checked for the eggs. Perhaps I was too distracted by the murderous goings on of a carnivorous snail or the extraordinary love life of a net-casting spider. It was that kind of garden.

When I wrote my book *Garden Jungle* I had no idea that much of the invertebrate behaviour I was describing in its chapters was previously unrecorded. My years of creature watching were entirely a labour of love, springing from a childhood fascination with insects and spiders. At times I had sent away photographs or specimens for identification but I hesitated to kill 'my' Balsam Beasts.





A mating pair



Female ovipositing in bark (captive situation)

Now I make an exception. I had met Dr. Ken Key, who at the time curated the Orthoptera at the CSIRO Insect Division in Canberra and it is to Ken that I eventually send specimens. Quite excited, Ken tells me that up until now only two specimens are known, one held at Canberra and the other in the insect collection of the Australian Museum. My Balsam Beast, it seems, is not only an undescribed species but also appears to be a new genus.

Now I have a call from Dr. David Rentz who has taken over as Curator of Orthopteroids in Canberra. Ken Key has handed over to Dave all the information about my enigmatic insect. David and I discuss writing a joint paper giving it scientific recognition as a new species and genus – and I am to have the honour of giving it a name. This is something new for me. How to adequately describe my Balsam Beast in two words of Greek or Latin? Like Shakespeare I have little Latin and less Greek. Why use Latin or Greek in the first place? Well, it is the tradition and I decide to follow it, as best I can. So here goes . . .

If this is to be an entirely new genus it seems OK to make the genus name a description of this particular species. Importantly, it is a pollen feeder – a *palynivore*. But wouldn't *flower lover* be nicer, with *antho* and *philo*? There could also be a reference to flight so how about *ptera* for wings? As for the specific epithet, perhaps something that speaks of its forest habitat – how about *dryad*, the Tree Spirit of Greek mythology? Well yes, dryads were all female, but a little poetic licence here. So up comes *Anthophiloptera dryad* and that sounds OK to me for a first stab at scientific nomenclature.



So my Balsam Beast is duly christened in the Journal of the Australian Entomology Society in 1983 under David Rentz's and my joint names. Somewhere along the line someone changes *dryad* to *dryas* which might alter the meaning a little, but no matter.

Sadly there are no balsam beasts in my present garden on the Mid North Coast of NSW. But just for fun recently I googled *Balsam Beast* on the Internet. And what do you know – up came a whole lot of websites using the common name I gave to an unknown insect in my Sydney garden so long ago! Such is fame...

Photos Densey Clyne

More on Summer Butterflies – Peter Hendry 22/04/2015

As a reply to my article, *A Summer of Butterflies 2014/2015 (aka the Year of the Tiger)*, I received, on the 4th of March, from Jak Guyomar, the following email summarizing his summer observations. I have added common names.

Good morning Peter,

I have just read your article in BOIC mag. MAGIC!

To add to observations-----Best season since c.2000

Observed at Gumdale, an eastern suburb of Brisbane, besides the usual stuff. These notes are only of the "unusual" obs.

- Fuscous Swallowtail (*Papilio fuscus*) males and females -- sometimes 4 specimens at a time. Still a couple passing through today.
- Macleay's Swallowtail (*Graphium macleayanus*) female ovipositing on *Cryptocarya triplinervis*. 27th Jan. A first for Gumdale. I could not believe my eyes.
- Four-barred Swallowtail (*Protographium leosthenes*) sometimes 4 males at a time battling for territory. Females ovipositing on *Melodorum*. I made a quick count of eggs 27th Jan on only 2 plants ---12 ova. As you know there is a lot of *Melodorum* here. Re-checked them next morning and most had been eaten by spiders only leaving a partial shell.
- Yellow Albatross (*Appias paulina*) Your photo shows the magnitude of them, mostly males by the look of it. Here in Gumdale there were mostly females. During a 20 min walk thru the bush I disturbed and counted over 20 females. This was 2nd Feb 15:00. The few males did not seem to be very interested in wooing females. We have the host plant but too high to look for ova.
- Indigo Flash (*Rapala veruna*) One freshly emerged male 2nd Feb.
- Yellow Migrant (*Catopsilia gorgophone*) numbers >10. Maybe some Orange Migrants (*Catopsilia scylla*)? I did not net any to verify. I must be getting old and lazy.



2nd Feb during a one hour lunch time count in our backyard there were 31 species! A bumper season no doubt. I wonder if I will live long enough to see it again?

Cheers-----Jak

Thanks Jak I am a bit jealous of your Macleay's Swallowtail ovipositing, I have only seen it once at Sheldon in Redland City, Queensland, and it did not stay long enough to do any ovipositing.

Now into autumn, here at Sheldon the number of Yellow Albatrosses has dropped to a few individuals. The Lemon Migrants (*Catopsilia pomona*) have all but disappeared and I have only seen one Blue Tiger (*Tirumala hamata hamata*) in the past six weeks. I have seen a few White-banded Planes/Common Aeroplanes (*Phaedyma shepherdii*) and found larva on *Millettia pinnata* (Fig. 1), though a known host plant it is the first time I have found them on it. The Plumbago Blue (*Leptotes plinius*) is still here in large numbers and I am starting to see the Large Grass Yellow (*Eurema hecabe*) and the Small Green-banded Blue (*Psychonotis caelius*). The odd Bordered Rustic (*Cupha prosope*) has passed through with no evidence of ovipositing. With the Native Wisteria Vine (*Callerya megasperma*) spreading through parts of the canopy, the property now supports a colony of the Narrow-banded Awl (*Hasora khoda*) (Fig. 2). Peter

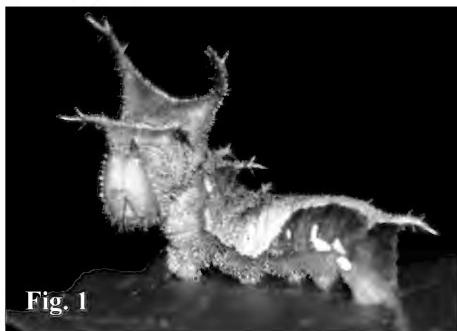


Fig. 1

Phaedyma shepherdii larva



Fig. 2

Hasora khoda

Photos Peter Hendry

Jak has just emailed some recent observations as follows:

Further observations in the last week. (15-22/04/2015)

- Green Awl fresh female, the host plant *Mucuna gigantea* is here.
- Common Aeroplane resident, on *Mucuna gigantea* and *Millettia pinnata*
- Bordered Rustic, a couple of females hanging around the *Scolopia* which has come into new leaf in the last couple of weeks without those confounded beetle larvae defoliating it.
- A couple more Indigo Flash



- Small green banded blues now numerous----- While sitting here at the computer I have just counted 7 making the most of the sunshine.
- Still a couple of Yellow Migrant males looking for females around the *Senna surratensis* which is in full flower.
- Splendid Ochre/Symmomus Skipper (*Trapezites symmomus*) a couple flying around *Lomandra longifolia*
- Still a few Yellow Albatrosses both sexes

Happy observing

A Tribute to Presidents Past – Rob MacSloy

With the retirement of our President, Ross Kendall, at our recent AGM it seems appropriate to reflect on the great service provided to the Club by Ross and our previous President (and Life Member) Helen Schwencke.

Helen was the Club's founder and her enthusiasm resulted in BOIC being formed in October 1994. She envisaged and guided us through the first major project – the Swallowtail Poster – and was instrumental in the Club producing a quarterly newsletter. Her tenure saw BOIC grow and prosper and the Club was represented at many environmental displays.

Ross became President in 2006 and brought to the Club new enthusiasm and his own thoughts on the direction the Club should take. He was the driving force behind the newsletter transmuting into a colour magazine – one which is well respected by invertebrates enthusiasts. He also was instrumental in the production of our recent 2015 calendar featuring the wonderful paintings of Lois Hughes.

Ross's aim was to see more members participate in Club activities and this has resulted in the election of our incoming President, Marie-Louise Johnson, and Secretary, Jill Fechner. Marie-Louise shares Ross's vision for more member participation be it through attendance at meetings or on excursions.

The Club, as from the beginning, remains in good hands.

IN THE GARDEN

We have created this new section in our magazine to encourage all of our members to share interesting encounters or sightings in their gardens or on bush walks. It may only be a couple of paragraphs, perhaps with a photo, or maybe to share the joy of discovering a creature new to you. It can be as long or as short as you wish. Writing an article can be daunting to many but most of us could manage a paragraph or two. Are you up to the challenge? Come on, surprise us all!



Lois Hughes has contributed the first in the series.

On our property at Mt. Cotton in Redland City, South-east Queensland, late one April afternoon in 2015, we disturbed an unfamiliar butterfly in a stand of tall green Panic grass. It landed on my hat before returning to the stand of grass. I was surprised to discover it was a female Common Brown.

It has been many years since this butterfly was here. My notes revealed it was in March 2001. Fortunately the previous butterfly landed at my feet and proceeded to lay her eggs on a blade of Kikuyu grass. I located the eggs and raised the caterpillars to maturity. Three males emerged from 8th-12th September 2001 and were released.



Larva - Photo Suzanne Jones



Common Brown (*Heteronympha merope*) female
Photo Cathy Powers



Common Brown (*Heteronympha merope*) male
Photo Russell Best

I will keep my eyes open in the expectation that this transient female has blessed us with eggs also.

Ed.: Kikuyu (*Pennisetum clandestinum*) is a known host plant for the Common Brown (*Heteronympha merope*).

YOU ASKED



John Moss was recently asked to identify this moth. His reply was – “This is a Granny's Cloak Moth (*Speiredonia spectans*) which is in the Catocaline subfamily of the noctuid moths. I discovered its life history in the Goodnight Scrub some years ago. The larvae were



feeding on Yellow Tulip tree, *Drypetes deplanchei*, which is also the host plant for the Yellow Albatross butterfly which has been migrating through SEQ with the Blue Tigers and others in recent months

Since the onset of wet weather they have become more common in and around houses in SEQ where, seeking shelter in dark places, they often find their way into garages, under cars, in sheds and outhouses, under verandahs and if given the chance into cupboards, wardrobes and cellars. Thus one reason for the common name "cloak moth", although its "old-fashioned" drably ornate livery may also account for the name."

ARTICLE FROM A PAST ISSUE

Processionary caterpillars *Ochrogaster lunifer* Issue 40 March 2006

Extra notes on Processionary or Tent caterpillars to the information given in "**Hairy abortions**" (BOIC Newsletter #39: 18 – 20). *Ochrogaster lunifer* (previously known as *Teara contraria*) belongs to the moth family Thaumetopoeidae, and has moths with hairy bodies and wingspans up to 40 to 60 mm. Tents or larval communal shelters are 250 mm or more across.

The Processionary caterpillar is believed to be a complex of species. Around the Brisbane region, it prefers to eat acacia foliage and nest in tents at the base of the trunk. However in the Toowoomba region, the Processionary caterpillar eats eucalyptus leaves and nests in tents strung amongst the foliage. The caterpillar may pupate in these tents or in the soil. When caterpillars are seen wandering around a

lawn or away from the tree, it is either because the tent has been breached/disturbed, or they are searching for fresh foliage, or they are searching for a pupation site. The 'species' is known across Australia. In early writings, graziers on their horses, used pole cutters to cut down these aerial tents. However tents falling on the horse and causing the horse to go crazy, are also noted (W.W. Froggatt, 1923. Forest insects of Australia).



Ochrogaster lunifer

My experience with these caterpillars goes back to when I was a boy who couldn't resist collecting a fascinating column of marching caterpillars. I broke out in an extremely itchy rash that lasted three days. I kept some larvae in a tin which was lost in amongst my belongings, until three years later, when I opened this tin to find these dried caterpillars inside. Again I had to suffer three days of unbearable itchy rash. I always believed this species was the worst in the Brisbane region. Australia does have some nasty caterpillars with setae (sharp rigid hairs) that can penetrate skin and eyes, but of the species that have irritating hairs, the Processionary caterpillar is most often seen around Brisbane. Southeast Queensland has larvae capable of causing skin blistering, stinging or rashing from the families Thaumetopoeidae, Eupterotidae,



Anthelidae, Lymantriidae, Arctiidae, Limacodidae and Nolinae (Noctuidae). The White cedar moth larvae (*Leptocneria* spp.) can also be irritating, but can be eliminated by not growing White cedars (*Melia azedarach*) or as Don Herbison-Evans and Debbie Racklyeft (authors of 'Hairy Abortions') indicated, by the use of sacks tied around the tree trunk. Hiding larvae can then be removed.

When tents are disturbed, wandering larvae may die away from the tree, thus causing problems for grazing animals and gardeners. Discarded larval skins after pupation can also cause problems. Lawn mowers blow up hairs which land on sweaty skin and cause irritations. Each hair fragments into smaller pieces, and is spread by scratching the site and then touching other sites. The victim's body will soon be covered with welts.

I consider nests at the base of trees could be burnt, however this could be dangerous as a fire could burn into the trunk of the tree. Tree nests are very dangerous to cut down, because a breeze could blow hairs into the pruner operator. Also falling nests will break open and spill larvae everywhere. Another control strategy to target is egg tracking. Around the Brisbane area, moths lay egg masses covered with whitish fluff, on the lower trunks of Acacia trees, from November to January. A note should be recorded in your diary to search for eggs during this period, and crush these egg masses. Chemical controls would seem extreme and impractical, because a systemic insecticide would need to be used on breeding trees every year during January to April or May.

I have bred fly and wasp parasites from Processionary caterpillar larvae. A small pyralid moth larva is also implicated as attacking eggs. Birds, for example Cuckoos, have been recorded as eating larvae.

There are some excellent articles on the Processionary caterpillar, and in particular, Graham Floater at the University of Queensland, has published some informative findings. I have some **references** below.

- Floater, G.J. 1996. Life history comparisons of ground- and canopy-nesting populations of *Ochrogaster lunifer* Herrich-Schaeffer (Lepidoptera: Thaumetopoeidae): evidence for Two species? Aust. Jnl. of Entomology, 35: 223-230.
- Floater, G.J. 1996. Estimating movement of the Processionary caterpillar *Ochrogaster lunifer* Herrich-Schaeffer (Lepidoptera: Thaumetopoeidae) between discrete resource patches. Aust. Jnl. of Entomology, 35: 279-283.
- Van Schagen, J.J., Majer, J.D. & Hobbs, R.J. 1992. Biology of *Ochrogaster lunifer* Herrich-Schaeffer (Lepidoptera: Thaumetopoeidae), a defoliator of *Acacia acuminata* Bentham, in the Western Australian wheatbelt. Australian entomology Magazine 19 (1): 19 - 24

Murdoch De Baar.

Ed.: visit <http://lepidoptera.butterflyhouse.com.au/noto/lunifer.html> to see photos of *Ochrogaster lunifer*





wingspan:
40 – 43mm

Meadow Argus

Junonia villida



Fanflowers
Scaevola spp.

© photos by Helen Schwencke, 2009
& Frank Jordan

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Grow this plant - Support this butterfly



Butterfly Lives -

are as series of Butterfly Lifecycle and Ecology Interpretation Signs.

Starting in 2003 with an invitation from the Woodford Folk Festival to become involved with the butterfly project on site, various host plants along the Welcome/Butterfly Walk have been signposted with images of butterflies.

As I ran walks during Festivals, it became increasingly clear that people generally only see information about, and photos of, adult butterflies, and mostly only hear about nectar plants for butterflies – a disconnected story.

In 2008 I decided to change this view of butterflies wherever I could. This process had already been commenced in my book *Create More Butterflies* (with Frank Jordan, 2005). I have now produced complete lifecycle signs for over 50 host plants (and over 30 butterfly species). Each sign tells an ecological story.

Helen Schwencke

BOIC Founding & Past President, Life Member

Ed.: Visit Helen's website at www.earthling.com.au - email info@earthling.com.au

BUTTERFLY AND OTHER INVERTEBRATES CLUB PROGRAMME

Planning and General Meeting

What: Our planning meetings are informative and interesting. As well as planning our activities we share lots of information. All members are welcome as this activity is also a general meeting of members. Following the meeting we will be walking through the bushland adjacent to the centre. If you have ideas about invertebrate activities in your area, please come along to the meeting. We would love to hear your suggestions.

When: **8th August, 2015** from 9.30 am

Where: Downfall Creek Bushland Centre, 815 Rode Road, McDowall, Qld

Who: All members are welcome

RSVP: Marie-Louise on 0422 970 184 or email nabid@aapt.net.au

2015 Native Flower Show and Plants Market

What: We will have a display at this event. This show had previously been called the SGAP Spring Flower Show. This year's theme is "*Native Gardens are for Wildlife too!*"

When: **15th and 16th August, 2015**

Where: Brisbane Botanic Gardens, Mt Coot-tha

Moth Day

What: Looking at the moth family Anthelidae – there will be a formal talk on the *History of the Anthelidae with notes on separating out some species*. The talk will be followed by participants putting names on specimens in their collections or their photographs, so bring your Anthelidae specimens and photos. For those who wish to stay there will be a BBQ and a light trap in the evening. Bring your own meat – salads and extras will be provided.

When: **Saturday 22nd August, 2015** – gather at 1pm – the talk will start at 1.15pm sharp

Where: At Peter and Beverley Hendry's place at Sheldon, Redland City, Qld

Who: All members are welcome.

RSVP: Phone 3206 0048 to book a place – address and directions will be provided



DISCLAIMER

The magazine seeks to be as scientifically accurate as possible but the views, opinions and observations expressed are those of the authors. The magazine is a platform for people, both amateur and professional, to express their views and observations about invertebrates. These are not necessarily those of the BOIC. The manuscripts are submitted for comment to entomologists or people working in the area of the topic being discussed. If inaccuracies have inadvertently occurred and are brought to our attention we will seek to correct them in future editions. The Editor reserves the right to refuse to print any matter which is unsuitable, inappropriate or objectionable and to make nomenclature changes as appropriate.

ACKNOWLEDGMENTS

Producing this magazine is done with the efforts of:

- Those members who have sent in letters and articles
- Lois Hughes who provided the cover painting
- Daphne Bowden who works on layout, production and distribution
- John Moss, Dr E.D. Edwards, Martyn Robinson and Ross Kendall for scientific referencing and proof reading of various articles in this issue of the magazine

ARE YOU A MEMBER?

Please check your mailing label for the date your membership is due for renewal. If your membership is due, please renew as soon as possible. **Membership fees are \$30.00 for individuals, schools and organizations.** If you wish to pay electronically, the following information will assist you: BSB: **484-799**, Account No: **001227191**, Account name: **BOIC**, Bank: **Suncorp**, Reference: your membership number and surname e.g. **234 Roberts**.

Butterfly and Other Invertebrates Club Inc.
PO Box 2113
RUNCORN Q. 4113

Next event – Planning and General Meeting – Downfall Creek Bushland Centre, 815 Rode Road, McDowall, Qld on 8th August 2015

